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A record of early Silurian glacioeustacy from the Type Llandovery

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Recent detailed work on the Type Llandovery succession in central Wales, UK has allowed the erection of a thoroughly revised sedimentary architecture and new sequence stratigraphical model. Significant new chitinozoan, acritarch and graptolite discoveries have refined the succession's potential for international correlation. The new analysis reveals that Rhuddanian to Aeronian parts of the Type Llandovery succession were fashioned by movements in marine base level. A series of flooding surfaces are overlain by progradation sequences (progrades) in which laminated, off-shore mudstones pass vertically and laterally into bioturbated shoreface sandstones; pentamerid-bearing sandstones characterising the shallowest phases of deposition. At the tops of the progrades, erosion surfaces recording emergence merge laterally into the compound unconformities that characterise condensed, proximal parts of the succession. The progrades comprise a succession of smaller scale parasquences. They can also be grouped into composite (higher order) sequences and both these and their component progrades can now be dated using the standard UK graptolite biozonal scheme. Three composite sequences are recognised that reached their progradational acme during the *acinaces*, lower *convolutus* and upper *sedgwickii-halli* graptolite biozones. Significant lower order progrades occurred during the *revolutus*, *triangulatus* and both the middle and upper *convolutus* biozones. Following a post-glacial maximum *persculptus* Biozone highstand, the succession of Llandovery flooding surfaces record transgressions that peaked during the *revolutus*, middle *convolutus* and lower *sedgwickii* biozones; significant secondary events are linked to local first appearances of *revolutus* and upper *convolutus* graptolite biozonal assemblages.

The early Silurian retreat of the Gondwanan-based South Polar ice sheet was interrupted by episodes of ice re-advance during the Rhuddanian and Aeronian and published dating supports the confident interpretation of the three higher order Llandovery area sequences as the culmination of the forced regressions that accompanied these glacial events. Studies of other Llandovery successions suggest that lower order events during the *triangulatus* and *convolutus* biozones are also widespread and promote the possibility that all the Llandovery area progrades were far field responses to glacial re-advance. Recalibrated dating of the Type Llandovery succession makes this model for a glacioeustatically determined Rhuddanian to Aeronian sequence stratigraphy available for international testing. Evidence of a eustatic signal is lacking in Telychian strata in Wales where the impact of any eustatic sea level movements was enhanced or overridden by the growing influence of intra- and peri-basinal tectonism.